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ABSTRACT

Brain Gym is an educational curriculum that promotes whole brain learning through movement repatterning to improve students performance and attitudes about the learning process. This study of Brain Gym in relation to classroom climate and academic performance was conducted with 28 fourth-grade students in a midwestern urban parochial school. Participants were in a class taught in a traditional way by a traditional teacher who considered Brain Gym an interruption in her scheduled class activities. Findings indicated that students preferred more satisfaction and cohesiveness than they actually perceived in their classroom, both before and after the study, as well as less friction and competitiveness. The majority of students' grades stayed the same or declined in all subjects but English and spelling. However, in English and spelling, the majority of students received higher grades at the conclusion of the 9-week grading period than they received for the previous grading period. Study results suggested: (1) Brain Gym not only allowed students to move, but enabled them to feel a sense of hope and to make choices in their classroom; (2) teacher beliefs and attitudes about teaching and learning informed the results of the Brain Gym project; and (3) for school reform projects to succeed, consideration must be given to how they are initiated and implemented and to the effect they have on individuals. (Contains 29 references.) (ND)

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Can Adding Movement to Learning Improve the Classroom Environment?

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R Templeton

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INTRODUCTION

As we walk down the hall and linger to look into one classroom, we see students sitting in rows and staring at their science textbooks, while student after student takes turns reading a paragraph or two. The teacher standing at the front of the room asks questions about the facts just read. The room is quiet except for the drone of student reading. At the end of the section, students are instructed to answer the six questions summarizing the facts on earthworms. One student asks, "But why do we have to answer these questions?" The teacher responds, "That's the only way I can tell if you really know about earthworms."

Down the hall, in another classroom, students are working in small groups. The room buzzes with productive activity. One group is intent on discovering the parts of the earthworm by examining the worms squiggling on a paper plate and then comparing them to pictures in several books. A second group is using desktop computers to create reports on their findings. They access the World Wide Web to find material relevant to their topic and discover that other students around the world are studying earthworms. One student, while looking at his screen, excitedly shouts, "Let's see if we can create a worm farm, like those kids in New Hampshire did." Another group is delicately crafting an earthworm from papier-mache' materials. Still another group is seen in the far corner of the room, creating the "Dance of the Earthworm." As the music plays, students sway to the rhythm. The teacher circulates from group to group--listening, asking probing questions, suggesting resources, and encouraging their efforts. Students express thoughts; their peers question and extend the thinking. New ideas emerge.

PURPOSE

Movement is the door to learning.
(Dennison and Dennison, 1989)

Researchers conducting this comparative study set out to investigate whether a program called Brain Gym improved the classroom climate and/or academic performance in one fourth grade classroom within a parochial school. Rooted in the principles of educational kinesiology, Brain Gym is an educational curriculum that promotes whole brain learning through movement repatterning to improve students' performance and attitudes about the learning process.

PERSPECTIVES

> During the twentieth century, behaviorists have promoted the view that education is a matter of conditioning, and they believe it is possible to shape human behavior to any and every desired form. . . . (However) recent medical research has provided us with new insights regarding the structure and function of the human brain. It has shifted our attention from the study of observable behavior to the physiological bases of the brain's potential for knowing, thinking, and directing human actions. The findings of the neuroscientists invite us to look within as well as without for our understanding of human behavior. Likewise, they lead us to review and to reformulate our assumptions about learning and teaching (Cooke and Haipt, 1986, p. 8).

What Brain Research Tells Us

The human brain is composed of the cerebrum, the cerebellum, and the brain stem. Accounting for 85% of the brain's total mass, the cerebrum is divided into the right and the left hemispheres. These hemispheres, connected by bundles of nerve fibers, are each divided into four lobes. The left side of the brain receives information from the right side of the body, and the right side of the brain receives information from the left side of the body,. This is accomplished through nerve cells and nerve fibers, which constitute an important component of the body's central nervous system. Starting at the brain, the nervous system

extends through the spinal cord to other parts of the body (Cooke & Haipt, 1986). Without covering the complex workings of the dendrites, axons, and synapses, we can get a sense of this message operation by saying that an individual nerve cell receives messages from other nerve cells and through nerve impulses sends the message throughout the body (Parnell, 1996).

To clarify hemispheric specialization or the functions of each hemisphere, Richard L. Hopkins (1984) explains:

> The left hemisphere seems better at sequential ordering, analyzing essentials, and making direct relationships. It is dominant in speaking, reading, writing, and simple calculation . . . However, the right hemisphere seems to be better at simultaneous patterned thinking and integrating parts into wholes. Often this has been associated with the visual world . . . The patterning of the right hemisphere is in the abstract, tactile, kinesthetic, and auditory worlds. These intellectual processes are important in our culture, but in a world focused on literacy, they seem to be neglected in much of formal education (pp. 133-134).

Furthermore, researchers (Eisner, 1994; Cooke & Haipt, 1986; Hopkins, 1984) explain that the functions of the left or right hemispheres can atrophy or strengthen with use or disuse.

Armed with this knowledge, how do our schools measure up? More than one educational reformer has observed that teaching strategies favor learning with only the left side of the brain. Madeline Hunter explains, "Schools have been beaming most of their instruction through a left-brained input and output system, thereby handicapping all learners" (1981, pp. 45-48). Another opponent of left-brain teaching, Parnell says, "What we do in much of contemporary pedagogy is require students to commit bits of knowledge to memory in isolation from any practical application and to simply take our word that they, 'might need it someday' " (1996, p. 18).

Taking the notion of schools promoting left-brain teaching and learning a

step further, Leslie A. Hart (1983) explains that if students feel threatened, if they cannot succeed, the brain will "downshift." Downshifting means activating the more primitive brain that deals with reflexive behaviors and emotions, which inhibits using reflection, foresight, and problem solving skills. In other words, many students who do not feel successful will turn off the learning process and shift to a defensive mode. If pressured to complete learning activities, defensive students will rebel.

Brain-Based Learning

Several theorists (Parnell, 1996; Caine & Caine, 1994; Hart, 1986; Nummela & Rosengren, 1986; Neve, 1985) promote creating learning environments that teach to the student's whole brain. Approximately 25 years ago, Hart (1986) unveiled his Proster Theory of Human Learning, which emphasizes that the brain will attempt to integrate patterns and develop what he calls "program structures" or "prosters." According to his theory, the most effective learning occurs when external sensory input challenges the student's brain to either recall and integrate the greatest number of existing programs, expand an already existing program, or develop new programs (Neve, 1985; Nummela & Rosengren, 1986).

Examining brain-based learning theory from another perspective, Caine and Caine (1995) explain that it is important for the brain to do patterning or integrating information. However, equally important is the brain's ability to be a parallel processor. In other words, the brain performs many functions simultaneously. For example, when the brain is not fully engaged in productive learning, it is still actively patterning random thoughts, day dreams, or fantasies that could lead to misbehavior.

Guided by the knowledge of how the brain learns, brain compatible

learning environments are characterized by three elements. First, environments are created where students feel relaxed, contented, and involved in the learning process. In these stress-free environments, since there is no need to feel threatened, students rarely "downshift" or turn off the learning process (Hart, 1986; Nummela & Rosengren, 1986; Neve, 1985). A second quality of a brain-based learning environment is that learning has to be connected to real-life experiences (Parnell, 1996; Caine & Caine, 1995; Neve, 1985). In other words, students must be given opportunities to connect the content of knowledge with the context of application by experiencing many different social interactions. As a third characteristic, communication (reading, writing, listening, and talking with others) is the key to processing ongoing changes and experiences. Talking to enhance learning, expand existing knowledge, and solve problems is encouraged and facilitated. Adults and children alike have opportunities to reflect upon and actively process ideas in social settings (Neve, 1985).

With all that is known about how the brain learns and what a brain-compatible learning environment should include, why are there so few "brain-rich" classrooms in our schools? Brain-based learning proponents give several reasons; however, these explanations have one common thread--schools are slow to change. How slow? In discussing educational change, Parnell notes, "The educational enterprise has remained essentially unchanged over the past 100 years. We have standardized tests and textbooks that do little to connect content to context. . . " (1996, p. 20). While the traditional mental model of learning is being challenged by many theorists, and educational reformers are searching for ways to incorporate whole brain activities into today's classrooms, what is happening to students who find "learning is a grim, scary, closed-in, super-structured, and silent process?" (Chenfeld, 1992, p. 89). Experts on brain-based learning say "shut-down" is the obvious answer--where students resist learning and

tend to become defensive when forced to complete traditional learning tasks.

To counteract this learning "shut-down," Paul E. Dennison supplies one solution--adding brain integrated movement to the learning process. With the help of learning specialists, developmental optometrists, and kinesiologists, Dennison (1989) developed an educational program called Brain Gym. He promotes Brain Gym as having the ability to improve classroom climate, provide a sense of balance, and increase academic performance when students complete a series of simple movements or brain integrative activities. These movements are designed to help students access and integrate different parts of the brain, so that the right and left hemispheres can work together in harmony.

Like other brain research proponents (Caine & Caine, 1995; Hart, 86; Nummela & Rosengren; 1986; Neve, 1985), Dennison suggests that when an individual is under stress, the body tends to act from one hemispheric mode, thus eliminating the proper balance needed for optimal learning, self-control, and problem solving (Sifft, 1990). Said in another way, when a student feels threatened she may either become too emotional and not be able to verbalize her feelings, or she may want to analyze the situation by talking but is not able to see the broader picture. Brain Gym activities reduce the blockages caused by stress and allow the body to function in an optimal state of learning and self-control (Sifft, 1990).

To describe each exercise and its specific function is beyond the scope of this paper; however, each Brain Gym session begins with a set routine called PACE. With PACE, movements are used to facilitate a natural flow of mind and body working together to ensure that learning is Positive, Active, Clear, and Energetic. The first step toward energetic learning is to drink water. Water dissolves the salts in the body, forming electrolytes that makes it possible to conduct electrical currents between the brain, muscles, and sensory organs.

Next, clear learning is facilitated by massaging the soft tissue area under the clavicle to the left and right of the sternum to help regulate the firing of the neurotransmitters at the synapses in the brain. Third, active learning is accomplished by doing movements that cross over the midline of the body and activate right and left hemispheres to work in harmony. Finally, positive learning is created by doing exercises that connect all the energy circuits in the body at one time and get the electrical energy in the body moving, which relieves stress and facilitates learning (Grinde, Hannaford, Shaner, & Zachary, 1991). Recent research findings (Hannaford, 1990; Latham, 1990; Sifft & Khalsa, 1991; Sifft, 1991) propose that children and youth who use Brian Gym activities while in school improve, not only academically, but socially and emotionally.

METHODS

Study participants included 28 fourth grade students who attend an urban parochial school in the Midwest. These subjects consisted of 19 males and nine females, 20 of whom are Caucasians and eight of whom are minority students. As an indicator of socio-economic status, it was determined that six of the 28 students qualify for free lunches, while the remaining 22 qualify for neither free nor reduced lunches.

My Class Inventory

These fourth graders completed both the preferred and actual short forms of Fraser's My Class Inventory (1989), prior to participating in this study's treatment. Seven weeks later, at the conclusion of their involvement in the study, these same students once again completed the actual short form of Fraser's My Class Inventory (MCI).

The short form of the MCI, which was designed for use by primary and middle school students, consists of 25 items within five different scales. The

MCI's purpose is to assess students' perceptions of both their preferred and actual learning environments, with regard to the five dimensions of: satisfaction, friction, competitiveness, difficulty, and cohesiveness. Sample items for each of the five scales of the actual form of the MCI appear in Table 1. Item wording for the preferred form of the MCI is almost identical to that of the actual form. For example, an item such as "My class is fun." (actual form) is changed to "My class would be fun." (preferred form).

The MCI's Yes/No response format is intended to make the questionnaire simple to complete. Students record their answers on the questionnaire itself, a format designed to avoid errors that can occur in the process of transferring responses to a separate answer sheet. The process of hand scoring the MCI is expedited by the fact that questionnaire items from each of the five scales are arranged in cyclic order and in blocks of five. Those items which are reverse scored are marked with an R in the *For Teacher's Use* column of the MCI. The total score for a scale is then derived by adding the scores for the five items belonging to that particular scale.

As Table 2 illustrates, in a study that featured an Australian sample of third grade students, reliability for the actual form of the MCI ranged from 0.58 for the Difficulty scale to 0.81 for the Cohesiveness scale. The reliability for the remaining three scales of the MCI's actual form were 0.68 for Satisfaction, 0.70 for Competitiveness, and 0.78 for Friction. For the preferred form, reliability ranged from 0.60 for Difficulty to 0.82 for Friction. The reliability for the other three scales of the preferred form were 0.75 for Satisfaction, 0.77 for Competitiveness, and 0.78 for Cohesiveness. Fraser (1989) drew the conclusion that the preceding values indicate that the MCI's short forms, both actual and preferred, demonstrate satisfactory reliability for scales containing only five items. It should be noted that in this Australian study both forms of the MCI were

administered orally to respondents, because of concern that reading difficulties might act as a compounding variable when using the MCI with third grade students.

Interpretive Research Methodology

To provide answers to questions that surfaced while analyzing the data, an interpretive research methodology similar to that employed by Erickson (1986) was used in this study. Information was gathered by direct observations of training sessions that were conducted by the Brain Gym specialists and by observations of the teacher completing Brain Gym exercises in her classroom. Additional facts were collected through formal interviews and/or informal discussions with students, teachers, principal, parents, and Brain Gym trainers. Examining artifacts related to this study also aided in the information gathering process. Material gathered was analyzed and used to form general assertions. These broad assertions were either supported or refuted, as well as refined and redefined, through further information collection.

FINDINGS

My Class Inventory Data Analysis

As Tables 3 through 6 demonstrate, students' responses to the actual and preferred short forms of the MCI indicate some significant differences. Using the software program entitled Statview to conduct statistical analyses, t-tests revealed significant statistical differences, $p<0.05$ on the Satisfaction, Friction, Competitiveness, and Cohesiveness scales in three different comparisons. These three different comparisons included: preferred MCI responses versus actual pre-assessment responses, preferred MCI responses versus actual post-assessment responses, and actual pre-assessment responses versus actual post-assessment responses.

Students' responses indicate that they preferred more satisfaction and cohesiveness than they actually perceived in their classroom, both before and after their participation in the study. Their responses also indicate they preferred less friction and competitiveness than they actually perceived in their classroom, both before and after their participation in the study. In addition, students' responses on the pre- and post-assessment actual form of the MCI suggest that they perceived more satisfaction and cohesiveness prior to their involvement in the study and less competitiveness prior to their involvement in the study. There were no statistically significant differences for the Difficulty scale for any of the three comparisons (preferred versus actual pre-assessment responses, preferred versus actual post-assessment responses, actual pre-assessment responses versus actual post-assessment responses).

Researchers also looked at students' grades as indicators of change over the course of the treatment. However, many more instances of no change in grades and/or declines in grades were noted than were instances of improvements in grades. As Table 7 illustrates, over a nine-week grading period, the majority of students had grades that stayed the same or declined by at least one grade level in seven of nine subjects. However, in English and spelling the majority of students received higher grades at the conclusion of the nine-week grading period than they received for the previous grading period.

Interpretive Analysis

> **Movement improvisation offers an alternative avenue to understanding for many students, especially those who learn well in a bodily-kinesthetic mode.**
> **(Griss, 1994, p.78)**

As I walk into the dimly lit gym for the first time and see this group of students, the word that comes to mind is "energetic." Movement is everywhere. Students are talking to neighbors, filling water bottles, and jumping around in

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their designated spots on the gym floor. The teacher seems nervous and uncomfortable with the noise and the movement, as she tries to quiet her students. Jen, the Brain Gym instructor, says in a raised voice, "Are you ready? Does every body have water? What are we going to start off with? While students become quiet and ready themselves, one boy yells, "Brain Buttons." With each exercise, they become more animated, with smiles and lots of laughter. It is easy to recognize that this group of mostly boys enjoys these movement activities. At the end of the first session, I informally ask students, "Why do you like Brain Gym?" In response, the answer heard most often is, "It's fun!"

In the coming weeks, each of the Brain Gym sessions starts very much the same way, except toward the end of the training period when something unexpected happens. Jen explains:

> Toward the end, I'd come to do the session, and she (the teacher) wouldn't be in the gym. I'd have to go and get them. They'd have to change their shoes and get ready. But it really didn't take too much time. Then I would try and encourage her to do the Brain Gym with us. I'd say, "Mrs. Wood are you going to do the Cross-Crawl with us?" She'd start to do them, then she'd work her way to the side of the gym or to the bleachers and stop.

• • • •

Assertion One: Brain Gym not only allowed students to move, but enabled them to feel a sense of hope and to make choices in their classroom.

Almost all students in this fourth-grade classroom believed in the benefits of Brain Gym exercises. When asked if they thought Brain Gym had helped them, 22 students responded, "Yes," three students answered, "A little," and three students said, "No." Following are explanations of how Brain Gym movements helped some students:

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> Brain Gym helped me listen better. After we do it, we'd go upstairs, and the teacher would start talking and I would listen to her. Before, I was sort of sleepy and would lay around, but Brain Gym woke me up.
>
> Brain Gym got me ready to go. I could focus. I don't stutter as much.
>
> When we do Brain Gym I get my school work done quicker. Used to never get through my reading questions at end of story--now I do.

The most visible benefit of Brain Gym was that it allowed the students opportunities to move. In this traditional classroom, students were expected to be quiet and still. They spent most of their time sitting in their seats doing individual paper and pencil activities. Their body language and facial expressions showed they were restless and bored. Although the room had a no-nonsense atmosphere, when the routine became too tedious, as research (Jones & Jones, 1995) indicates, children would become disruptive. Mrs. Wood shared her ideas on the misbehavior in her room:

> The major problem with this group is they're not staying on task and all the movement around the room. Tony can't sit still. Henry, Toby, and Zack are good at basketball, so they can cause real problems with movement in here.

She remembered that the interview question was about Brain Gym and switched her thinking to share her thoughts about the movement capabilities of Brain Gym. She said:

> They got out of their seats and were able to move around. And I believe that they sit in their seats too long during the day. They need motion.

Furthermore, Brain Gym gave students a sense of hope--a way to improve their grades and behavior. During the informational meeting with parents and children, Brain Gym was promoted as a tool that would give students ways to

gain self-control and improve academic performance. Specific examples were given and an informational video was shown. Parents and children alike seemed curious and receptive to the possibility of having a "new fangled" (term a parent used) way to help their children improve their grades. I overheard one parent who said to another, "Do you think this stuff works?" Another parent said in almost a whisper, "What happened to teaching the basics?" Examining the use of Brain Gym from another perspective, one parent commented, "I don't know if this stuff

will help my kid or not. Maybe it will; maybe it won't. But one thing for sure, it won't hurt the classroom to have a little change." Hope in the possibility of academic improvement is reflected in the following comments from students. They said:

> I used to play videos (at home). Now I just get my homework done and have time to spend doing other things with my family.
>
> It helps me concentrate. I'm better at my work. My grades are better.
>
> At home I'm doing my homework faster. . . not counting on fingers. . . doing my times and remembering them.
>
> I would do bad in science. . . .from C's to B's.' It made me remember the answers on the test--to get better grades.

Finally, Brain Gym allowed these fourth-graders to have some choice in their structured and somewhat rigid classroom routine. In essence, to be effective, the Brain Gym program requires doing movements before each subject. This criterion encouraged students moving several times per day. Ideally, the teacher is supposed to lead and monitor students in completing the movements. However, in this classroom, Mrs. Wood allowed children to complete the exercises, on their own, as long as they were quiet.

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During the seven weeks, the instructors gradually trained the class to do specific exercises for activities such as reading, writing, thinking, self-awareness, and homework. At the end of each session, instructors invited the children to continue to do the exercises daily before they started any new tasks. Near the end of the project, students were asked if they would continue to use Brain Gym. Nineteen students responded, "Yes," and nine students responded with, "No."

A man has two reasons for doing anything--a good reason and the real reason.

J. Pierpont Morgan,
American philanthropist

Prim, proper, petite, and reserved are adjectives that characterize Mrs. Wood. In her all brown polyester pant suit, she looks similar to the teachers I fondly remembered having more than 30 years ago. As she rotates among her class, her body language projects her as an "I mean business" kind of a teacher. By the way she interacts with students, it is clear that her teaching style comes from the old school. While I sit on the bleachers, Mrs. Wood stands near, scolding a group of eighth-graders who have kicked over the fourth-graders' water bottles, as they walked by. Towering over Mrs. Wood, these boys, rather than listening to what she has to say, seem intent on getting away from her.

Mrs. Wood's appearance and teaching style "fit" well with, St. Pilla, the school she has been teaching in for many years. Like many schools, St. Pilla uses the old "factory" model of schooling. "Authority is centralized and flows down from the top. Teachers, like workers along an assembly line, are seen as interchangeable parts, and students are viewed as products moving along (a conveyer belt)" (Meek, 1995, p.3). Like many teachers in "factory" schools, Mrs. Wood is an incredibly hard worker. Examining teachers' strong work ethic,

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Theodore Sizer of Brown University tells us that "under the factory model of schooling, it is the teacher who did the real 'work' in the classroom (Meek, 1995, p. 5).

* * * *

Assertion Two: Teacher beliefs and attitudes about teaching and learning influenced the results of the Brain Gym project.

The principles and assumptions embedded in current brain research and the Brain Gym program were not compatible with Mrs. Wood's beliefs about how students learn and how teachers teach. For her, students learn when they are on task--interpreted to mean "sitting quietly at their desks, busily doing work, and having little or no interactions with peers." Students are not learning when, as Mrs. Wood says, "There is too much movement around the room, with lots of talking."

Additionally, Mrs. Wood's beliefs about her role as teacher and the job of teaching are similar to what Fullan (1991) calls the "technical" actor or one who "gives knowledge and follows and applies rules" (p. 142). With this traditional view of education, it was difficult for Mrs. Wood to allow her class to leave the room where learning took place, to go to the gym, which she traditionally viewed as a place to go when you have no learning to do. This belief is reflected in her comments concerning her perceived time restraints of the Brain Gym program.

She stated:

> To do it all, it would take at least a half an hour in the morning. And then five minutes or more, if you did it three times a day. So, you see, that would be another fifteen minutes or more. So that would be a big chunk out of the class time, each day.

However, research (Moyer, 1993) has provided strong evidence that the mind and body are intimately connected and that the mind lives in both the brain and the body. Nevertheless, to Mrs. Wood, the mind and body were unconnected parts--building the body in the gym and building the brain in the classroom. She reflects this belief in her answer to the question, "Do you think Brain Gym is valuable?" She said:

> I think exercise is valuable. I think if they could get up and do some type of aerobics or some type of moving around a few times a day. . . that would be good. It's the movement that is important for the body. With the movement they acted less bored.

Not only did Mrs. Wood's beliefs about teaching and learning influence how the Brain Gym project was played out, but her attitude swayed the project's ending results. To illustrate, Mrs. Wood believed she had a difficult class--over two-thirds were boys. This group of boys were causing her problems--defying the rules and getting poor grades. She asked for help and was given Brain Gym. Mrs. Wood wanted a quick method of controlling disruptive behavior, but what she got instead was a way to dramatically change her thinking and teaching.

Fullan (1991) tells us that not all teachers see the need for or want to make improvements, and Mrs. Wood held this perspective. She personifies the

attitude of another teacher, Liz, in How to Talk so Kids Can Learn at Home and in School (1995). Liz stated:

> My idea of how to get cooperation was similar to the Nike slogan: "Just do it!" After all, I had spent a lot of time carefully planning and segmenting the day into a series of meaningful lessons. We had a lot of material to cover and not much time in which to cover it. So if the class would just sit there quietly and "cooperate," we would be able to maximize our instructional time (Faber, Mazlish, Nyberg, & Anstine Templeton, p. 59).

For Mrs. Wood, Brain Gym created far more costs than benefits. To explain, because she believed that her room was too crowded, she wanted to use the gym regularly to do the exercises. This meant Mrs. Wood had to negotiate with other teachers for use of the gym. She elaborates on this issue, "Space was a big problem. If we could go to the gym, it wasn't a problem. But we couldn't get it all the time."

Another cost was the tension created by determining whose leadership prevailed during the project--the principal's, the teacher's, or the Brain Gym instructor's. Although Mrs. Wood was presented as a volunteer, it became obvious that she was really "hand-picked" by the principal. In St. Pilla, leadership was hierarchical, like it is in most "factory" schools. Fullan (1991) reminds us that forced change rarely is successful. Mrs. Wood was not given the option to stop the project when and if she deemed it necessary. As a "forced" volunteer, Mrs. Wood resorted to creative insubordination and sabotaged many of the Brain Gym objectives. Mrs. Wood implicitly let her students know that Brain Gym did not work by not having them ready for training sessions, not doing the exercises during the training sessions, and choosing not to lead the exercises during the week.

Whether influenced by beliefs and attitudes or rebelling against forced

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change, observations and interviews revealed that Mrs. Wood did not believe that Brain Gym was an effective teaching tool--one that could help students gain self-control and improve academics. At the end of the seven weeks, when asked, "Do you think Brain Gym is valuable?" she responded:

> I need more convincing than what I've seen. Of course it has been just a seven week program. I realize that it is a short program, and that we're dealing with a number of children with a number of problems. And that maybe one-on-one, I could see improvement. . . . .possibly. Only, if I could see that in practice, but I didn't get a chance to see that in practice. (Long pause--thinking) Now, I was watching the children who had poor penmanship and had trouble tracking when they read, thinking that these exercises that we're doing would definitely help those children, but I didn't see any improvement.

> **The arts heal, increase awareness, and realize individuality, besides developing the body and the mind. They should play a far more important role in public education than has ever been assigned to them.**
>
> **(Moffett, 1994, p. 72)**

One day, early in the school year, at 11:30 in the morning, a child went to the closet, took his jacket and bag, and started for the door. Stopping him, the teacher gently asked him where he was going.

"Home," he said.

"Honey," she told him, "You don't go home now. You're in 1st grade. You get to stay all day."

Placing his hands on his hips, with wide eyes, the boy asked, "Well, who the hell signed me up for this?"

(Chenfeld, 1992, p. 89)

* * * *

Assertion Three: In order for school reform projects, like Brain Gym, to succeed concentration needs to be given to how they are implemented and the effect they have on individuals.

There are a number of possibilities for why Brain Gym has had no long term influence in St. Pilla. Analysis of this particular study revealed a lack of pre-planning and consideration of the effect of change. First, attention should be given to how the Brain Gym project was implemented. Brain Gym was characterized as a "one-shot" delivery method. The seven, one-hour training sessions may have been adequate to show students how to do the mechanics of the exercises. However, Mrs. Wood received little prior knowledge or training. Jen comments on Mrs. Wood 's induction into the Brain Gym program by saying:

> We gave her the tapes and a video to watch, and I guess we thought that she knew what she was doing. We met with them (Mrs. Wood and principal) a couple of times. We asked Mrs. Wood if she had any questions on how to do the Brain Gym exercises. Both times she said, "No." At first it seemed fine. She would do the exercises with us, but then she would not want to participate. It was hard for me to go around and show the kids how to do them the right way when someone needed to be up front to continue to show the entire group what to do.

To ensure success of a project like Brain Gym careful long-term planning must occur prior to its implementation. Joyce and Showers (1988) tell us that effective training starts with a presentation of the theories behind the strategies to be implemented. As Jen stated, Mrs. Wood was given two audio tapes and an informational video that, if listened to and watched, would have given her a theoretical understanding of Brain Gym. I suspect that if the information was digested, it was not completely understood. When asked to share her knowledge, she would always say, "I really don't understand some of that stuff."

After an understanding of theoretical concepts has been developed, demonstrating and practicing strategies under simulated conditions come next. With the practice of new skills comes structured feedback to help refine them. Finally, coaching is provided to ensure that the skills have been applied correctly

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in the natural setting (Joyce & Showers, 1988). Although Mrs. Wood could watch Jen demonstrate the movements, she was not given opportunities to practice the skills or receive feedback on how she performed the movements. Additionally, coaching was a missing link in the implementation of Brain Gym in Mrs. Wood's classroom.

Success will be determined by how a staff development project is implemented; however, it is equally important for facilitators to take into account how the proposed change affects all people involved. At St. Pilla, Mrs. Wood was the person most directly affected by the Brain Gym project. Although her beliefs and attitude influenced the project's lack of success, there were other issues that contributed to such a disappointing end result. On the one hand, when Mrs. Wood asked for help she was not involved in searching for possible solutions. Yet, on the other hand, the principal, knowing that Brain Gym had helped some disruptive students in the past, immediately assumed that it would help Mrs. Wood and her disruptive boys.

Nevertheless, Fullan (1991, p. 137), in providing guidelines to determine if a change project is valuable, suggests that teachers ask themselves a number of questions. First, "If the change is proposed from the outside, does it really address an important need?" Since Mrs. Wood was a "conscripted" volunteer for the Brain Gym project, with no choices, she decided that the project was not the answer to her problem and innocently sabotaged any hope of the program having a lasting result in St. Pilla. A second question teachers should ask is, "How committed is the administration to the change effort?" In the Brain Gym project, the benefits to the administration definitely outweighed the costs. The training was volunteered free of charge; a solution to handling disruptive students and, therefore, a method of giving hope to a discouraged teacher was provided; and administrators were not required to take an active part in the movement project.

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A final question for teachers in the mist of change should be to ask, "Are fellow teachers likely to show interest in the reform effort?" Collegiality among teachers is needed to sustain the excitement and motivation in any new project. If collaboration is missing, then teachers like Mrs. Wood will feel isolated and lonely, and will deem any change effort as not useful.

CONCLUSION

Those who will begin with certainties shall end in doubts; but those content to begin with doubts shall end in certainties.

--adapted from Sir Francis Bacon, The Advancement of Learning

> The more we move the more interconnections that we make with our brain--integrative, energetic thinking. This is how people learn, by moving. Hopefully, in the next ten years, education will catch up and it'll be in public schools. We're really working on that heavily. It wakes up the other systems of the body when you move. And then you start to add that beautiful, sensory splendor. And then you add application and what happens? You learn! So we have an incredible tool here. . . . Edu-Kinesthetics (Brain Gym) gives us that solid thing to step out on--the body-mind connection. And it gives us the wings to fly beyond our limitations (Hannaford, 1992).

While examining the research on brain compatible learning, not only did these researchers feel surges of excitement when thinking about future educational possibilities, but we were left with many nagging doubts because so much is yet to be discovered about the capabilities of the brain. Although the results of this study certainly do not fortify contentions that participating in "Brain Gym" activities contributes to students' academic achievement, neither do they disprove the benefits attributed to "Brain Gym." There are many plausible interaction effects that were not controlled in this study, some of which may have directly or indirectly impacted treatment results.

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The use of interpretive methodology uncovered possible explanations for the fact that students reported experiencing more competitiveness in their classroom at the end of the study than at the beginning of the study and less satisfaction and cohesiveness at the end than at the onset. To illuminate, near the end of the project, formal and informal observations and interviews revealed that students had either accepted or rejected the principles of Brain Gym. On the one hand, those who had rejected the exercises appeared to be the students who were eager to please the teacher. They remained in their seats, were quiet at all times, and completed work as assigned. On the other hand, students who accepted Brain Gym were the students Mrs. Wood considered disruptive--the ones who talked too much and never stayed in their seats. Although not fully understanding the interactional dynamics of this group, Mrs. Wood had realized that something had happened in her room. She says, "In the beginning only about ten percent of the students liked Brain Gym, but it picked up toward the end. I don't know if I'd be exaggerating, if I said now 50 percent like Brain Gym." One has to wonder if Brain Gym gave discouraged students another way of expressing their dissatisfaction with the tedium and rigidity of the classroom. Did students use Brain Gym to get the teacher angry? When asked, "Does your teacher like Brain Gym?" one of its strongest advocates said, "It doesn't matter cause I'm going to do them anyway."

Though not as easily detected, intervening variables also may have affected the decline or static nature of students' grades for the seven-week period of the study. We do know that when we hear comments such as, "We're dealing with a number of children with a number of problems," or "Kids in here aren't working. They're more interested in causing trouble," or "The girls don't cause any trouble, just the boys," then we may have a classroom environment that is not conducive to learning. In addition, Jones and Jones remind us that, "A

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significant body of research indicates that academic achievement and students' behavior are influenced by the quality of the teacher-student relationship" (1995, p. 59). In this challenging situation, it is conceivable that Mrs. Wood had become frustrated with the disruptive boys in her room, and this frustration had an effect on the relationship she maintained with them.

By examining this study from another perspective, what becomes clear is that Mrs. Wood, a seasoned teacher, is working in a profession that has changed as rapidly as the students whom she teaches. Teachers are no longer cloaked in automatic respect, as they enter the profession. Currently, educators are viewed with caution and, at times, with suspicion. Highlighting this phenomenon, Heath states, "Teachers do not feel respected for their vision of what they contribute to society's children" (1994 p. 261)

Though society's view of educators has changed, so has the type of students teachers are teaching. In Schools of Hope, Heath (1994) discussed his thoughts on the changing students in today's schools. He said:

> Experienced teachers don't doubt that youths' personalities have been changing noticeably since the mid 1950's. They believe that their students are less educable for the ways they have been taught to teach them (p. 3).

From this perspective, Mrs. Wood may be using teaching strategies that have been successful for years, but, because of the dynamics of this particular group of students, these strategies proved ineffective. To resolve the problem, she is encouraged to try Brain Gym, which is not successful because of poor planning and her attitudes and beliefs. What is the answer? For her, it is to make it through the year as painlessly as possible and hope that next years' students will be better.

IMPLICATIONS FOR FURTHER RESEARCH

The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition if you will, and the solution comes to you and you don't know how or why.

Albert Einstein (1879-1955)
German-American physicist

The research (Parnell, 1996; Caine & Caine, 1995; Griss, 1994) has indicated strongly that brain-based learning, or adding movement to learning is an important teaching tool for today's students. A program such as Brain Gym that promotes the principles of, not only how the brain learns, but of educational kinesthetics or movement should play a vital part in the design of classrooms today and in the future. To determine the usefulness of Brain Gym, more research needs to be conducted. With this study completed, these researchers provide three suggestions for future studies. First, in the teacher selection process, make certain each teacher desires to be part of the project and is not a "conscripted" volunteer. Also important in the selection process is to determine if the concepts of brain-based learning and Brain Gym are compatible with the teachers' beliefs and attitudes. Completing attitude surveys and doing informal interviews are ways to ensure that the right group of teachers has been selected.

Second, before implementing a Brain Gym project, do the necessary pre-planning. Clearly define expectations for collaboration; develop supportive structures, e.g., adequate space and time; and ensure that the benefits to all involved outweigh the costs of implementing the innovation. Additionally, develop an implementation system where theoretical knowledge is understood, and modeling, practicing, feedback, and coaching are provided. Next, build an awareness of the change process for those involved in the project. With any reform effort, teachers should understand that it is normal to feel an initial excitement, then to doubt, resist, and finally accept the innovation. Our final

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suggestion, if using a quantitative methodology, is to use a control group to gain a clearer understanding of the results.

Table 1

Sample Scale Items: MCI Actual and Preferred Short Forms

		Satisfaction
Actual	-	The pupils enjoy their schoolwork in my class.
Preferred	-	The pupils would enjoy their schoolwork in my class.
		Friction
Actual	-	Pupils are always fighting with each other.
Preferred	-	Pupils always would be fighting with each other.
		Competitiveness
Actual	-	Pupils often race to see who can finish first.
Preferred	-	Pupils often would race to see who can finish first.
		Difficulty
Actual	-	In my class the work is hard to do.
Preferred	-	In my class the work would be hard to do.
		Cohesiveness
Actual	-	In my class everybody is my friend.
Preferred	-	In my class everybody would be my friend.

Table 2

Reliability for MCI, Actual, and Preferred Short Forms

Scale	Alpha Coefficients	
	Actual	Preferred
Satisfaction	0.68	0.75
Friction	0.78	0.82
Competitiveness	0.70	0.77
Difficulty	0.58	0.60
Cohesiveness	0.81	0.78

Table 3

Preferred MCI, Actual Pre-Assessment MCI, and Actual Post-Assessment MCI Responses: Means and Standard Deviations

Scales	Means			Standard Deviations		
	Preferred	Actual Pre	Actual Post	Preferred	Actual Pre	Actual Post
Satisfaction	14.57	13.04	11.39	1.26	2.34	3.01
Friction	5.68	7.46	7.79	1.44	2.85	1.99
Competitiveness	6.79	10.69	11.64	1.77	3.48	3.23
Difficulty	5.75	6.42	6.36	1.56	2.08	2.11
Cohesiveness	14.14	12.00	9.29	2.14	3.26	3.77

Table 4

Preferred MCI and Actual Pre-Assessment MCI Responses: Paired t-Test Results

Scales	Mean Diff	DF	t-Value	P-Value
Satisfaction	1.50	25	3.16	.0041*
Friction	-1.73	25	-3.37	.0024*
Competitiveness	-3.92	25	-5.64	<.0001*
Difficulty	-0.81	25	-1.85	.0763
Cohesiveness	2.23	25	3.21	.0037*

* Significant at the .05 level

Table 5

Preferred MCI and Actual Post-Assessment MCI Responses: Paired t-Test Results

Scales	Mean Diff	DF	t-Value	P-Value
Satisfaction	3.18	27	5.48	<.0001*
Friction	-2.11	27	-5.46	<.0001*
Competitiveness	-4.86	27	-7.38	<.0001*
Difficulty	-0.61	27	-1.88	.0707
Cohesiveness	4.86	27	5.58	<.0001*

* Significant at the .05 level

Table 6

Actual Pre-Assessment MCI and Actual Post-Assessment MCI Responses: Paired t-Test Results

Scales	Mean Diff	DF	t-Value	P-Value
Satisfaction	1.54	25	2.64	.0140*
Friction	-0.23	25	-0.53	.5999
Competitiveness	-0.92	25	-2.24	.0338*
Difficulty	0.04	25	0.09	.9297
Cohesiveness	2.69	25	3.04	.0055*

* Significant at the .05 level

Table 7

Frequency Distributions for Grade Changes

Subject	Down 2 or More Grades	Down 1 Grade	No Change	Up 1 Grade	Up 2 or More Grades	Total n
Computer	1	8	19	0	0	28
English	0	2	10	13	3	28
Language Arts	0	2	23	3	0	28
Math	0	8	20	0	0	28
Music	2	1	20	4	1	28
Religion	0	8	20	0	0	28
Science	2	2	22	2	0	28
Spelling	0	0	13	13	2	28
Social Studies	0	3	24	1	0	28

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